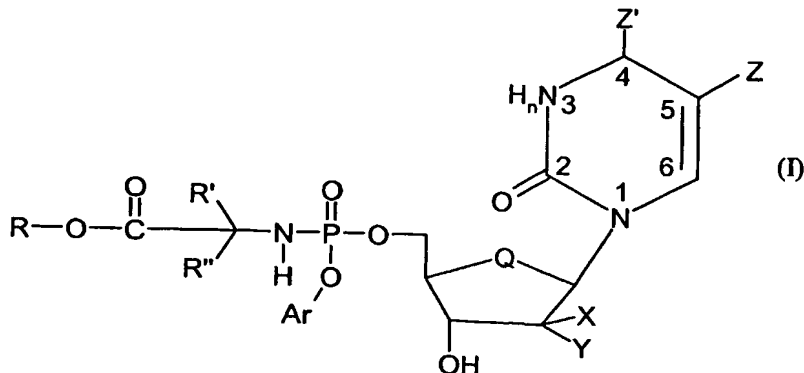


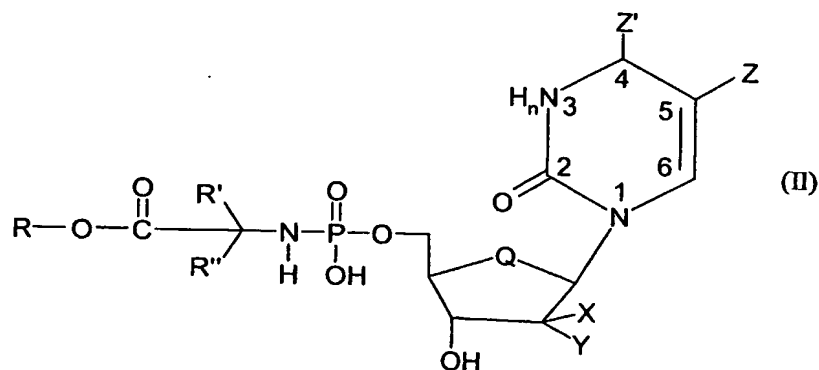
CLAIMS.

1. A chemical compound having formula I:



- 5 wherein:
- R is selected from the group comprising alkyl, aryl and alkylaryl;
- R' and R'' are independently selected from the group comprising H, alkyl and alkylaryl, or R' and R'' together form an alkylene chain so as to provide, together with the C atom to which they are attached, a cyclic system;
- 10 Q is selected from the group comprising -O- and -CH₂-;
- X and Y are independently selected from the group comprising H, F, Cl, Br, I, OH and methyl (-CH₃);
- Ar is a monocyclic aromatic ring moiety or a fused bicyclic aromatic ring moiety, either of which said ring moieties is carbocyclic or heterocyclic and is optionally substituted;
- 15 Z is selected from the group comprising H, alkyl and halogen; and
- n is 0 or 1,
- wherein when n is 0, Z' is -NH₂ and a double bond exists between position 3 and position 4, and
- when n is 1, Z' is =O;
- 20 or a pharmaceutically acceptable derivative or metabolite of a compound of formula I;
- with the proviso that, except where R is 2-Bu (-CH₂-CH(CH₃)₂) and one of R' and R'' is H and one of R' and R'' is methyl (-CH₃), when n is 1 and X and Y are both H, then Ar is not unsubstituted phenyl (-C₆H₅).

2. A compound according to claim 1 wherein R is selected from the group comprising a C₁₋₁₆ primary or secondary alkyl group, a C₅₋₇ carbocyclic aryl group or a C₁₋₆alkylC₅₋₁₁ aryl group.
- 5 3. A compound according to claim 2 wherein R is selected from the group comprising methyl (-CH₃), ethyl (-C₂H₅) and benzyl (-CH₂C₆H₅).
4. A compound according to claim 3 wherein R is benzyl.
- 10 5. A compound according to any one of the preceding claims wherein Ar is an optionally substituted C₆ monocyclic aromatic ring moiety, ie is optionally substituted phenyl.
6. A compound according to claim 5 wherein Ar is selected from the group
15 comprising -C₆H₅, *p*CF₃C₆H₄-, *p*FC₆H₄-, *p*NO₂C₆H₄-, *p*ClC₆H₄- and *o*ClC₆H₄-.
7. A chemical compound having formula II:



- wherein n, Q, R, R', R'', X, Y, Z and Z' have the meanings described in claim 1, and
20 additionally R can be H, with provisos that:
when n is 1, X and Y are both H, R is methyl (-CH₃), one of R' and R'' is H and one of R' and R'' is methyl (-CH₃), then Z is not -CH=CHBr;
when n is 1, X and Y are both H, R is methyl (-CH₃), one of R' and R'' is H and one of R' and R'' is phenylethyl, phenylmethyl, indol-3-ylmethyl or indol-3-ylethyl, then Z is not F;
25 and
when n is 0, X is not H.

8. A compound according to any one of the preceding claims wherein R' and R'' are, independently, selected from the group comprising H, C₁₋₆ primary, secondary and tertiary alkyl, C₁₋₃alkylC₅₋₇ aryl, or, when together they form an alkylene chain, they provide,
5 together with the C atom to which they are attached, a C₃₋₈ carbocyclic aliphatic ring.

9. A compound according to claim 8 wherein R' and R'' are, independently, selected from the group comprising H, methyl, benzyl and -CH₂CH(CH₃)₂, or, R' and R'' together with the C atom to which they are attached, provide a C₅₋₆ ring.
10

10. A compound according to claim 9 wherein R' and R'' are each methyl.

11. A compound according to claim 9 wherein one of R' and R'' is H and one of R' and R'' is methyl.
15

12. A compound according to claim 9 wherein the carbocyclic ring is a pentyl ring.

13. A compound according to any one of the preceding claims wherein R' and R'' correspond to the side chains of a naturally occurring amino acid.
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14. A compound according to any one of the preceding claims wherein Z is selected from the group comprising H, C₁₋₆alkyl, substituted C₁₋₆alkyl, C₁₋₆alkenyl, substituted C₁₋₆alkenyl, C₁₋₆alkynyl, and halogen.

25 15. A compound according to any one of the preceding claims wherein Q is O.

16. A compound according to any one of the preceding claims wherein when n is 1, each of X and Y is H.

30 17. A compound according to any one of claims 1 to 15 wherein when n is 0, each of X and Y is F.

18. A compound according to any one of claims 1 to 15 wherein when n is 0, X is OH and Y is H.
19. A compound according to any one of claims 1 to 15 wherein when n is 0, X is H and Y is OH.
20. A compound selected from the group comprising:
- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[phenyl-(ethoxy-L-alaninyl)]-phosphate (CPF 3)
 - 10 (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[phenyl-(benzoxy-L-alaninyl)]-phosphate (CPF 2)
 - (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-fluorophenyl-(methoxy-L-alaninyl)]-phosphate (CPF 5)
 - (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-fluorophenyl-(ethoxy-L-alaninyl)]-phosphate (CPF 6)
 - 15 (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-fluorophenyl-(benzoxy-L-alaninyl)]-phosphate (CPF 7)
 - (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-nitrophenyl-(methoxy-L-alaninyl)]-phosphate (CPF 10)
 - 20 (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-nitrophenyl-(ethoxy-L-alaninyl)]-phosphate (CPF 9)
 - (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-nitrophenyl-(benzoxy-L-alaninyl)]-phosphate (CPF 8)
 - (E)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[para-(trifluoromethyl)-phenyl-(methoxy-L-alaninyl)]-phosphate (CPF 15)
 - 25 (E)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[para-(trifluoromethyl)-phenyl-(ethoxy-L-alaninyl)]-phosphate (CPF 25)
 - (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-trifluorophenyl-(benzoxy-L-alaninyl)]-phosphate (CPF 4)
 - 30 (E)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[4-chlorophenyl-(methoxy-L-alaninyl)]-phosphate (CPF 13)
 - (E)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[4-chlorophenyl-(ethoxy-L-alaninyl)]-phosphate (CPF 11)

- (*E*)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[4-chlorophenyl-(benzoxy-L-alaninyl)]-phosphate (CPF 12)
- (*E*)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[phenyl-(methoxy- α,α -dimethylglycinyl)]-phosphate (CPF 26)
- 5 (*E*)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[phenyl-(ethoxy- α,α -dimethylglycinyl)]-phosphate (CPF 27)
- (*E*)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[phenyl-(benzoxy- α,α -dimethylglycinyl)]-phosphate (CPF 14)
- (*E*)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[4-nitrophenyl-(methoxy- α,α -dimethylglycinyl)]-phosphate (CPF 45)
- 10 (*E*)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[4-nitrophenyl-(ethoxy- α,α -dimethylglycinyl)]-phosphate (CPF 46)
- (*E*)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[4-nitrophenyl-(benzoxy- α,α -dimethylglycinyl)]-phosphate (CPF 47)
- 15 (*E*)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[4-chlorophenyl-(methoxy- α,α -dimethylglycinyl)]-phosphate (CPF 42)
- (*E*)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[4-chlorophenyl-(ethoxy- α,α -dimethylglycinyl)]-phosphate (CPF 43)
- (*E*)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[4-chlorophenyl-(benzoxy- α,α -dimethylglycinyl)]-phosphate (CPF 44)
- 20 (*E*)-5-(2-bromovinyl)-2'-deoxyuridine-5'-[*para*-(trifluoromethyl)-phenyl-(benzoxy- α,α -dimethylglycinyl)]-phosphate (CPF 48)
- (*E*)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[phenyl-(methoxy- α,α -cycloleucinyl)]-phosphate (CPF 16)
- 25 (*E*)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[phenyl-(ethoxy- α,α -cycloleucinyl)]-phosphate (CPF 17)
- (*E*)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[phenyl-(benzoxy- α,α -cycloleucinyl)]-phosphate (CPF 18)
- (*E*)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[*para*-nitrophenyl-(methoxy- α,α -cycloleucinyl)]-phosphate (CPF 19)
- 30 (*E*)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[*para*-nitrophenyl-(ethoxy- α,α -cycloleucinyl)]-phosphate (CPF 20)

- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-nitrophenyl-(benzoxy- α,α -cycloleuciny)]-phosphate (CPF 21)
- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-fluorophenyl-(methoxy- α,α -cycloleuciny)]-phosphate (CPF 22)
- 5 (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-fluorophenyl-(ethoxy- α,α -cycloleuciny)]-phosphate (CPF 23)
- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-fluorophenyl-(benzoxy- α,α -cycloleuciny)]-phosphate (CPF 24)
- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-chlorophenyl-(methoxy- α,α -cycloleuciny)]-phosphate (CPF 32)
- 10 (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-chlorophenyl-(ethoxy- α,α -cycloleuciny)]-phosphate (CPF 33)
- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[phenyl-(methoxy-L-phenylalaniny)]-phosphate (CPF 36)
- 15 (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-chlorophenyl-(benzoxy- α,α -cycloleuciny)]-phosphate (CPF 34)
- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-trifluorophenyl-(methoxy- α,α -cycloleuciny)]-phosphate (CPF 28)
- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-trifluorophenyl-(ethoxy- α,α -cycloleuciny)]-phosphate (CPF 29)
- 20 (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-trifluorophenyl-(benzoxy- α,α -cycloleuciny)]-phosphate (CPF 30)
- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[phenyl-(methoxy-L-phenylalaniny)]-phosphate (CPF 36)
- 25 (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[phenyl-(methoxy-L-leuciny)]-phosphate (CPF 35)
- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[phenyl-(benzoxy-L-leuciny)]-phosphate (CPF 37)
- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-nitrophenyl-(benzoxy-L-leuciny)]-phosphate (CPF 38)
- 30 (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[para-chlorophenyl-(benzoxy-L-leuciny)]-phosphate (CPF 39)
- (E)-5-(2-Bromovinyl)-2'-deoxyuridine-5'-[phenyl-(2-butyl-L-alaniny)]-phosphate

Gemcitabine-[phenyl-(benzoxy-L-alaninyl)]-phosphate (CPF 31)

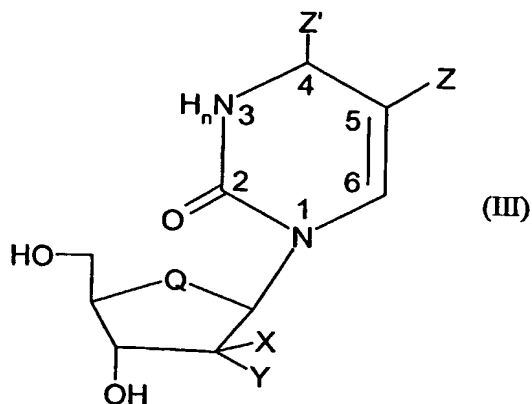
Gemcitabine-[para-chlorophenyl-(benzoxy-L-alaninyl)]-phosphate (CPF 40) and

Gemcitabine-[para-chlorophenyl-(benzoxy- α,α -dimethylglycinyl)]-phosphate (CPF 41).

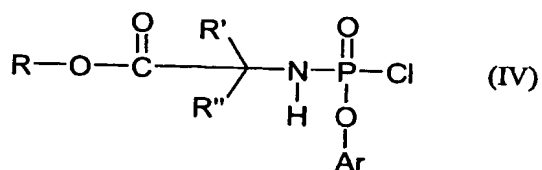
- 5 21. A compound according to any one of claims 1 to 6, claim 20, or to any one of
claims 8 to 19 as dependent on any one of claims 1 to 6, for use in a method of treatment,
preferably in the prophylaxis or treatment of cancer, with the proviso that when n is 1, X
and Y are both H, one of R' and R'' is H and one of R' and R'' is methyl (CH₃), R is 2-Bu
(-CH₂-CH-(CH₃)₂) or R is benzyl (-CH₂C₆H₅), then Ar can be unsubstituted phenyl (-
10 C₆H₅).
22. Use of a compound according to any one of claims 1 to 6, claim 20, or to any one
of claims 8 to 19 as dependent on any one of claims 1 to 6, in the manufacture of a
medicament for the prophylaxis or treatment of cancer, with the proviso set out in claim
15 21.
23. A method of prophylaxis or treatment of cancer comprising administration to a
patient in need of such treatment an effective dose of a compound according to any one of
claims 1 to 6, claim 20, or to any one of claims 8 to 19 as dependent on any one of claims 1
20 to 6, with the proviso set out in claim 21.
24. A pharmaceutical composition comprising a compound according to any one of
claims 1 to 6, claim 20, or to any one of claims 8 to 19 as dependent on any one of claims 1
to 6, in combination with a pharmaceutically acceptable carrier, diluent or excipient.
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25. A method of preparing a pharmaceutical composition comprising the step of
combining a compound according to any one of claims 1 to 6, claim 20 or any one of
claims 8 to 19 as dependent on any one of claims 1 to 6, with a pharmaceutically
acceptable excipient, carrier or diluent.
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26. A process for the preparation of a compound of formula I according to claim 1, the process comprising reacting of a compound of formula (III):



5 with a compound of formula (IV)



wherein Ar, n, Q, R, R', R'', X, Y, Z' and Z'' have the meanings described in claim 1.

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